

**Operating Instructions
Safety System
MGB-L..B-PN.-... (PROFINET)
with Data Structure Type B**

Contents

Scope	3
Correct use	3
Exclusion of liability and warranty	4
General safety instructions	5
Function	6
Interlocking module MGB-L0.B-PN.	6
Locking modules MGB-L1.B-PN. and MGB-L2.B-PN.	6
Control of the guard locking	7
System overview	11
Bus module MGB-B...-PN	11
Evaluation module MGB-L.-	12
Handle module MGB-H...	12
Escape release MGB-E... (optional)	13
Dimension drawing	13
Mechanical release	14
Lockout mechanism	15
Escape release (optional)	15
Mounting	17
Mounting color cover	17
Changing the actuating direction (here: from right to left)	19
Controls and indicators	21
Protection against environmental effects	22
Electrical connection	22
Connections on bus module	22
Setup	24
Integrating into PROFINET and PROFIsafe	24
Replacement of an MGB system without programming device	25
System reset to factory settings	25
Teach-in operation (only MGB unicode)	26
Mechanical function test	26
Electrical function test	27
PROFINET data bytes (data blocks for unsafe functions)	28
Data blocks for MGB modules	29
Data blocks of individual functions at a glance	31
PROFIsafe data bytes (data blocks for safe functions)	34
Diagnostic messages of the MGB system	36
PROFINET alarms	37
Fault in stacklight module	37
System status table LEDs on interlocking/locking module	38
Technical data	39
Troubleshooting	40
Latching fault when actuating the escape release	40
Fault reset	40
Service	41
Inspection and service	41
Declaration of conformity	42

Scope

This manual is valid for all MGB-PN with data structure type B from version number V3.22.0.

Correct use

MGB-LO

The safety system MGB-LO is an electromagnetic interlocking device without guard locking.

The system comprises at least one interlocking module MGB-LO and one handle module MGB-H...

In combination with a safety guard, this safety component prevents dangerous machine movements from being performed for as long as the safety guard is opened. A stop command is triggered if the safety guard is opened during the dangerous machine function.

For the control system, this means that

- starting commands which cause hazardous situations must become active only when the safety guard is in the protective position.

MGB-L1/MGB-L2

The safety system MGB-L1 / MGB-L2 is an electromagnetic interlocking device with guard locking and guard lock monitoring.

The system comprises at least one locking module MGB-L1 / MGB-L2 and one handle module MGB-H...

In combination with a safety guard and the machine control, the MGB system prevents the safety guard from being opened while a dangerous machine movement is being performed.

For the control system, this means that

- starting commands which cause hazardous situations must become active only when the safety guard is in protective position and the guard locking is in locked position.
- The locked position of the guard locking must be released only when the hazardous situation is no longer present.

MGB-LO/MGB-L1/MGB-L2

The interlocking module MGB-LOB-PN.-... and locking module MGB-L1B-PN.-... / MGB-L2B-PN.-... are operated as an IO device in the PROFINET (PROFIsafe).

Before safety components are used, a risk assessment must be performed on the machine, e.g. in accordance with

- EN ISO 13849-1, Safety of machinery. Safety related parts of control systems. General principles for design
- EN ISO 12100, Safety of machinery – Basic concepts - General principles for design - Risk assessment and risk reduction.

Correct use includes compliance with the relevant requirements for installation and operation, in particular

- EN ISO 13849-1, Safety of machinery. Safety related parts of control systems. General principles for design

- › EN 1088, Safety of machinery. Interlocking devices associated with guards. Principles for design and selection
- › EN 60204-1, Safety of machinery. Electrical equipment of machines. General requirements.

The safety system MGB can only be combined with the intended modules in the MGB system family.

On the modification of system components, EUCHNER provides no warranty for safe function.

The customer is responsible for the safe overall function, especially for the safe integration into the PROFI-safe environment.

Important!

- › The user is responsible for the integration of the device into a safe overall system. For this purpose, the overall system must be validated, e.g. in accordance with EN ISO 13849-2.
- › Correct use requires observing the permissible operating parameters (see Technical data).
- › If a product data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.
- › In the estimation of the PL for the overall system, a maximum value of 100 years can be assumed for the $MTTF_d$ according to the limit value in EN ISO 13849-1:2008, section 4.5.2. This corresponds to a minimum value for the PFH_d of $2.47 \times 10^{-8}/h$.

Exclusion of liability and warranty

In case of failure to comply with the conditions for correct use stated above, or if the safety instructions are not followed, or if any servicing is not performed as required, liability will be excluded and the warranty void.

General safety instructions

Safety switches fulfill personal protection functions. Incorrect installation or tampering can lead to fatal injuries to personnel.

Check the safe function of the safety guard particularly

- after any setup work
- after the replacement of an MGB component
- after an extended period without use
- after every fault

Independent of these checks, the safe function of the safety guard should be checked at suitable intervals as part of the maintenance schedule.

Warning!

Loss of safety function in the event of incorrect connection or incorrect use.

- Safety switches must not be bypassed (bridging of contacts), turned away, removed or otherwise rendered ineffective.

On this topic pay attention in particular to the measures for reducing the possibility of bypassing from EN 1088:1995+A2:2008, section 5.7.

- The switching operation is only allowed to be triggered by the intended handle module MGB-H... that is positively fastened to the safety guard.

The device is only allowed to be installed and placed in operation by authorized personnel

- who are familiar with the correct handling of safety components
- who are familiar with the applicable EMC regulations
- who are familiar with the applicable regulations on health and safety and accident prevention
- who have read and understood the operating instructions.

Important!

Prior to use, read the operating instructions and keep these in a safe place. Ensure the operating instructions are always available during mounting, setup and servicing. EUCHNER cannot provide any warranty in relation to the readability of the CD for the storage period required. For this reason you should archive a printed copy of the operating instructions. You can download the operating instructions from www.EUCHNER.de.

Function

Interlocking module MGB-LO.B-PN.

Together with a handle module, the interlocking module makes it possible to interlock movable safety guards. The combination also serves as a mechanical door stop at the same time.

The following switch-on condition applies to safety bit `SI1.0` (see also System status table and section PROFIsafe data bytes):

- Safety guard closed (T)
- Bolt tongue inserted into interlocking module (R)

The interlocking module detects the position of the safety guard and the position of the bolt tongue.

The bolt tongue in the handle module is moved into and out of the interlocking module by actuating the door handle.

Locking modules MGB-L1.B-PN. and MGB-L2.B-PN.

Together with a handle module, the locking module makes it possible to lock movable safety guards. The combination also serves as a mechanical door stop at the same time.

Important!

To operate the device as a guard lock according to EN 1088, the signals for door position (T=PROFIsafe bit `SI0.2`), bolt position (R= PROFIsafe bit `SI0.3`) and guard lock monitoring (Z= PROFIsafe bit `SI0.4`) must be polled in a logical AND operator. This operator is already implemented in the PROFIsafe data block (safety bit `SI1.0`).

As an alternative, you can also link the bits `SI0.2` to `SI0.4` individually to your control system.

The following switch-on condition applies to safety bit `SI1.1` (see also System status table and section PROFIsafe data bytes):

- Safety guard closed (T)
- Bolt tongue inserted into locking module (R)
- Locking arm in locking position (guard lock monitoring) (Z)

The locking module detects the position of the safety guard and the position of the bolt tongue. The position of the locking arm is also monitored.

The bolt tongue in the handle module is moved into and out of the locking module by actuating the door handle.

When the bolt tongue is fully inserted in the locking module, the locking arm locks the bolt tongue in this position. Depending on the version, this locking is by spring force or solenoid force.

Version MGB-L1B-...

The locking arm is kept in locked position by spring force and is unlocked by solenoid force (closed-circuit current principle).

Version MGB-L2B-...

The locking arm is kept in locked position by solenoid force and unlocked by spring force when the solenoid is switched off (open-circuit current principle).

Warning!

- The safety guard can be opened immediately in the event of interruption of the solenoid power supply!
- Usage only in special cases after strict evaluation of the accident risk (see EN 1088:1995+A2:2008, section 5.5)!

Typical case: If the risk of accidental locking inside a safety guard during a power failure is higher than the risk of ineffective guard locking.

Control of the guard locking

From MGB version V2.36.4, the factory ensures that control is possible only from the safe control area. Here, it was determined in the firmware that only bit SO 0.0 is evaluated.

By changing the parameters in the configuration tool of your control system, it can be set that bit O 0.0 (in the safe data block for the MGB evaluation module) is evaluated as well (see description of the data blocks on page 30).

Important!

Control of the guard locking via the safe control area does not provide increased safety, as the device-internal control of the guard locking is only of single-channel design.

Important!

The following functions depend on the MGB version, the version of the GSD file and the settings made there.

Compare the specified versions with those on your device and your GSD file. The version number of your MGB can be found on the type plate (format: V X.XX.X).

MGB version	GSD version	Continue in section ...
up to and including V 2.35.4	..._110026- 20110725	Case A
	..._110026- 20110815	Case A
from V 2.36.4	..._110026- 20110725	Case B
	..._110026- 20110815	Case C

Case A

You have an MGB with a version number of V 2.35.4 and a GSD file with a version number of ..._110026-20110725 or older. Or you have an MGB with a version number of V 2.35.4 and a GSD file with a version number from ..._110026-20110815.

The guard locking solenoid is controlled if

▸ bit O 0.0 **OR** bit SO 0.0 = 1

Truth table:

PROFINET bit O 0.0	PROFIsafe bit SO 0.0	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	inactive	active
1	0	inactive	active
1	1	inactive	active

What must be observed?

The guard locking can be controlled from the unsafe control area. The combination with the more up-to-date GSD file allows a parameter to specify which bits are to be used for control. However, the device does not support this function. In other words, the setting in your configuration software remains ineffective.

Case B

You have an MGB with a version number of V 2.36.4 and a GSD file with a version number of ..._110026-20110725 or older.

The guard locking solenoid is controlled if

for MGB-L1...

▸ bit SO 0.0 = 1

for MGB-L2...

▸ bit O 0.0 **OR** bit SO 0.0 = 1

Truth table:

PROFINET bit O 0.0	PROFIsafe bit SO 0.0	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	inactive	active
1	0	active	active
1	1	inactive	active

What must be observed?

Bit O 0.0 does not have any function with version MGB-L1.... In existing installations in which old devices are replaced with new ones (e.g. due to defect), malfunctions can occur if control via bit O 0.0 was programmed in the PLC.

Remedy:

1. Replace the old GSD file with a version from ..._110026-20110815.
2. In the parameter *Locking module – solenoid control*, activate unsafe control of the guard locking solenoid via bit O 0.0.
3. Set bit SO 0.0 permanently to the value 1.

➡ The guard locking solenoid is controlled exclusively via bit O 0.0

or

▸ change the control bit from O 0.0 to SO 0.0 in your PLC program.

Case C

You have an MGB with a version number of V 2.36.4 and a GSD file with a version number from ..._110026-20110815.

The guard locking solenoid is controlled if:

- bit SO 0.0 = 1 (factory setting)

Truth table:

PROFINET bit O 0.0 not relevant	PROFIsafe bit SO 0.0	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	inactive	active
1	0	active	inactive
1	1	inactive	active

What must be observed?

You can define in the GSD file whether bit O 0.0 may be used for control in addition to bit SO 0.0. The setting is specified in the parameter *Locking module – solenoid control*.

If O 0.0 is additionally used, the guard locking solenoid is controlled if for MGB-L1...

- bit SO 0.0 **AND** bit O 0.0 = 1
- for MGB-L2... bit SO 0.0 **OR** bit O 0.0 = 1

Truth table:

PROFINET bit O 0.0	PROFIsafe bit SO 0.0	Guard locking with	
		MGB-L1...	MGB-L2...
0	0	active	inactive
0	1	active	active
1	0	active	active
1	1	inactive	active

System overview

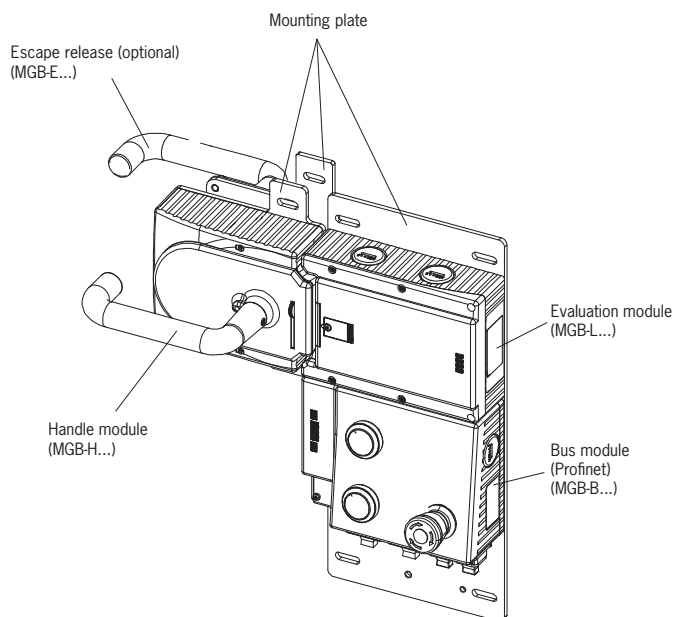


Figure 1: Components at a glance

Note: MGB-PN systems are completely factory configured. The configuration must not be changed subsequently. The illustrations in this section can deviate from your system and serve only as examples. The configuration of your MGB system can be found in the data sheet included with every MGB system.

Bus module MGB-B-...-PN

Key:

- ① LED indicator
- ② Power supply
- ③ PROFINET connection

Note:

Depending on the version, additional controls and indicators may be integrated into the cover. See enclosed data sheet.

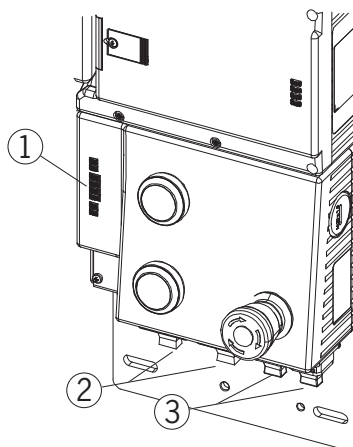


Figure 2: Bus module MGB-B-...-PN (configuration example)

Evaluation module MGB-L.-

Key:

- ① LED indicator
- ② Cover for mechanical release
- ③ Locking arm (only version with guard locking)
- ④ Auxiliary marking for max. permitted mounting distance

Note:

Depending on the version, additional controls and indicators may be integrated into the cover. See enclosed data sheet.

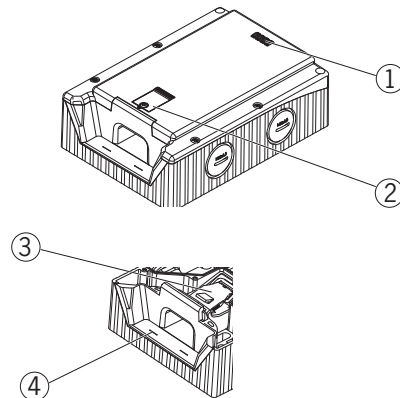


Figure 3: Evaluation module MGB-L.-

Handle module MGB-H...

Key:

- ① Door handle
- ② Locking pins for housing cover and handle adjustment
- ③ Lockout mechanism
- ④ Bolt tongue

Note:

Depending on the function, the handle can feature additional functions (second lockout mechanism, different handle, etc.). See enclosed data sheet.

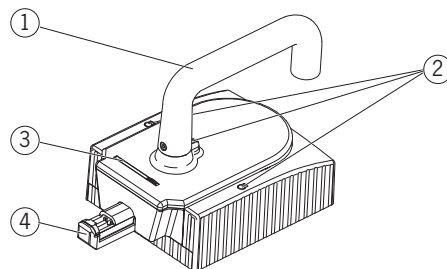


Figure 4: Handle module MGB-H...

Escape release MGB-E-... (optional)

Key:

- ① Door handle
- ② Setscrew
- ③ Cover
- ④ Actuation axis, length 118 mm (included)
Alternatively:
Long actuation axis, length 250 mm
(order No. 106 761)
- ⑤ Protective sleeve

Note:

Depending on the version, a mounting plate can be included. See enclosed data sheet.

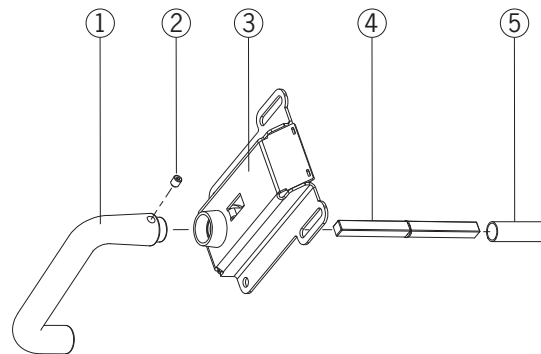


Figure 5: Escape release MGB-E-...

Dimension drawing

See enclosed data sheet

Mechanical release

In the event of service, the guard locking can be released with the mechanical release irrespective of the state of the solenoid (see Figure 6).

The locking screw must be screwed back in and sealed after use (for example with sealing lacquer). Tightening torque 0.5 Nm.

1. Undo locking screw.
2. Lift locking arm using a screwdriver and actuate door handle.

Important!

The system enters into a latching fault when the mechanical release is actuated. See "System status table LEDs on interlocking/locking module" on page 38, state *Signal sequence erroneous* (DIA1 flashes 7 times).

Note:

The system might not enter into a latching fault if the mechanical release is actuated very slowly.

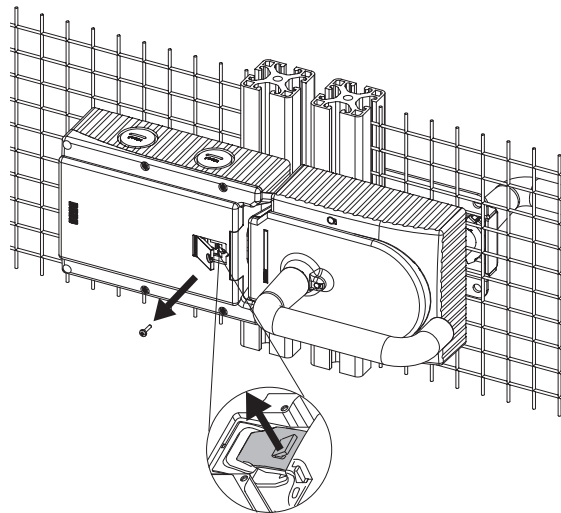


Figure 6: Mechanical release

Lockout mechanism

If the lockout mechanism is pivoted out, the bolt tongue cannot be extended. The lockout mechanism can be secured with padlocks (see Figure 7).

To pivot out, press the grooved part (only possible with bolt tongue retracted).

Key:

- ① Padlock Ø min. 2 mm, Ø max. 10 mm

Note:

You can fit a maximum of 3 locks Ø 8 mm..

- ② Automatically extending, second lockout mechanism
Padlock Ø min. 6 mm, Ø max. 10 mm

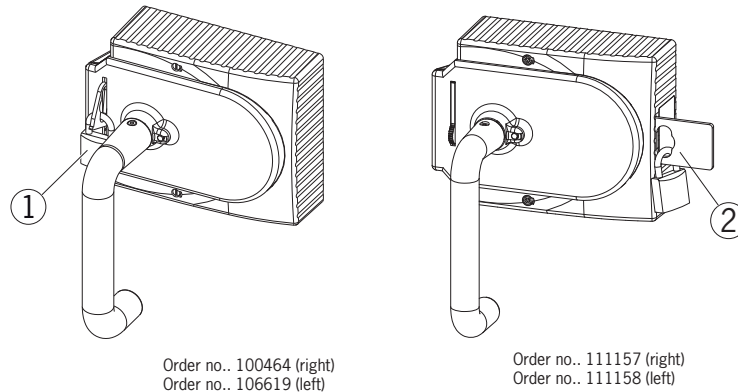


Figure 7: Lockout mechanism secured with padlock

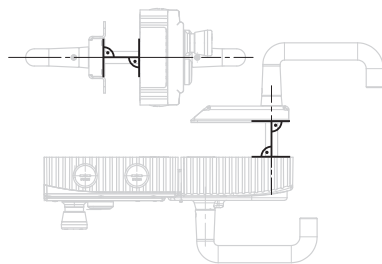
Escape release (optional)

The escape release is used to open a locked safety guard from the inside without tools.

Warning!

Loss of the safety function due to incorrect mounting of the escape release.

- The actuation axis for the escape release must be inserted min. 10 mm into the handle module.
- For profile widths larger than 40 mm and when using mounting plates, use a 250-mm actuation axis (order No. 106 761) and cut it to size.
- In case of profile widths smaller than 40 mm, cut actuation axis and protective sleeve to length.
- Align escape release axis at right angles to the handle module. See figure on left and Figure 8.
- Fit escape release such that operation, inspection and maintenance are possible.



Important!

The system enters into a latching fault when the escape release is actuated. See "System status table LEDs on interlocking/locking module" on page 38, state *Signal sequence erroneous* (DIA1 flashes 7 times).

Note:

The system might not enter into a latching fault if the escape release is actuated very slowly.

Preparation of the escape release

Example with mounting plates:

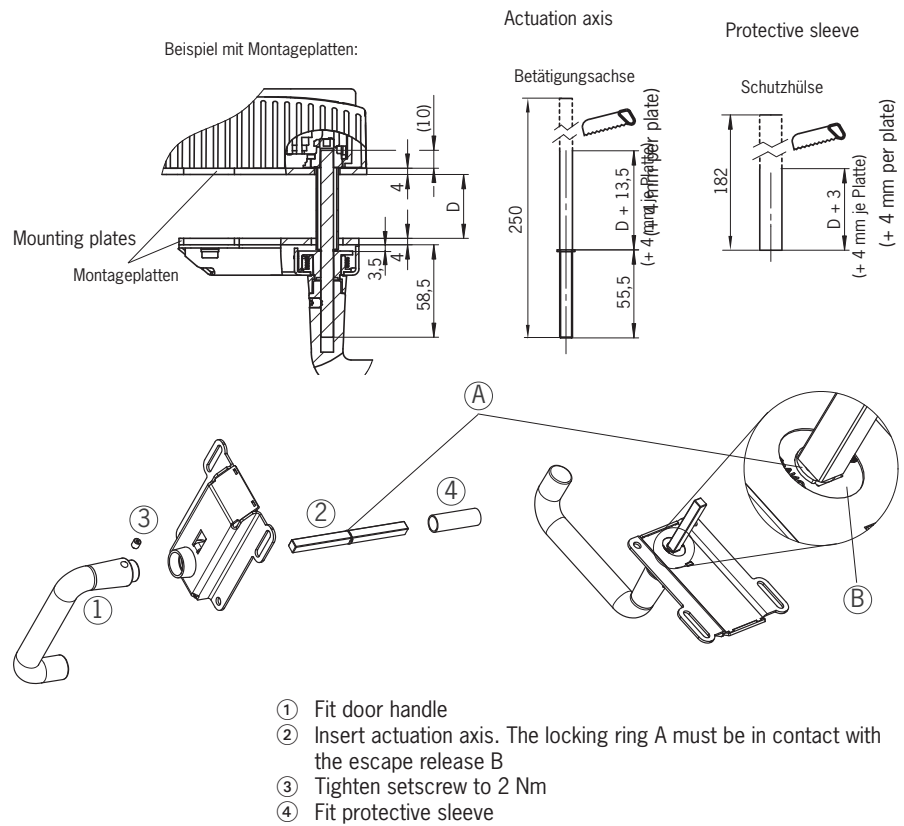


Figure 8: Preparing escape release

Mounting

Warning!

Mounting must be performed only by authorized personnel.

With two-wing hinged doors, one of the two door wings additionally must be latched mechanically.

Use a rod latch (Item) or a double-door lock (Bosch Rexroth) for this purpose, for example.

Tip!

The color and labeling of pushbuttons and indicators can be modified.

At least two M6 screws each must be used to install the evaluation module and the handle module (tightening torque 4 Nm).

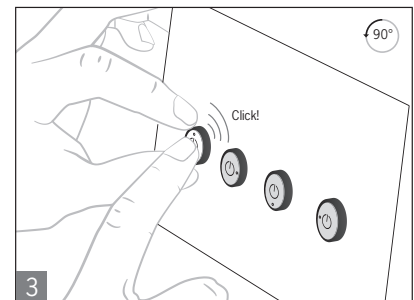
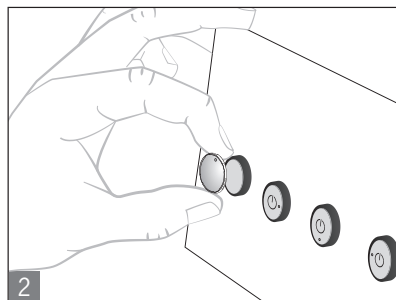
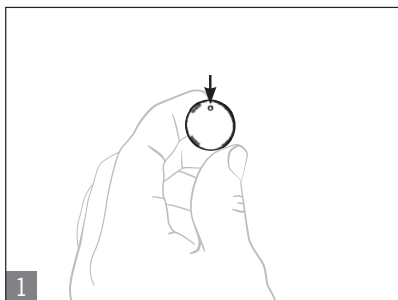
For installation steps see Figure 9.

Install system so that

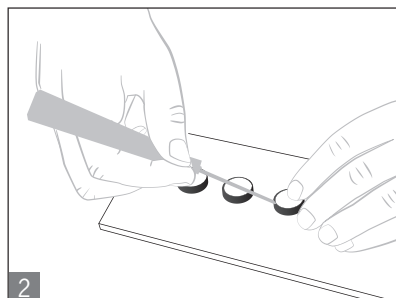
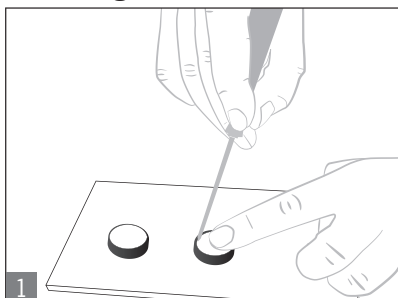
- Operation of the mechanical release as well as inspection and maintenance are possible.
- The locking screw of the escape release must be returned to its original position and sealed before putting into operation (for example with sealing lacquer).

Mounting color cover

Mounting



Removing



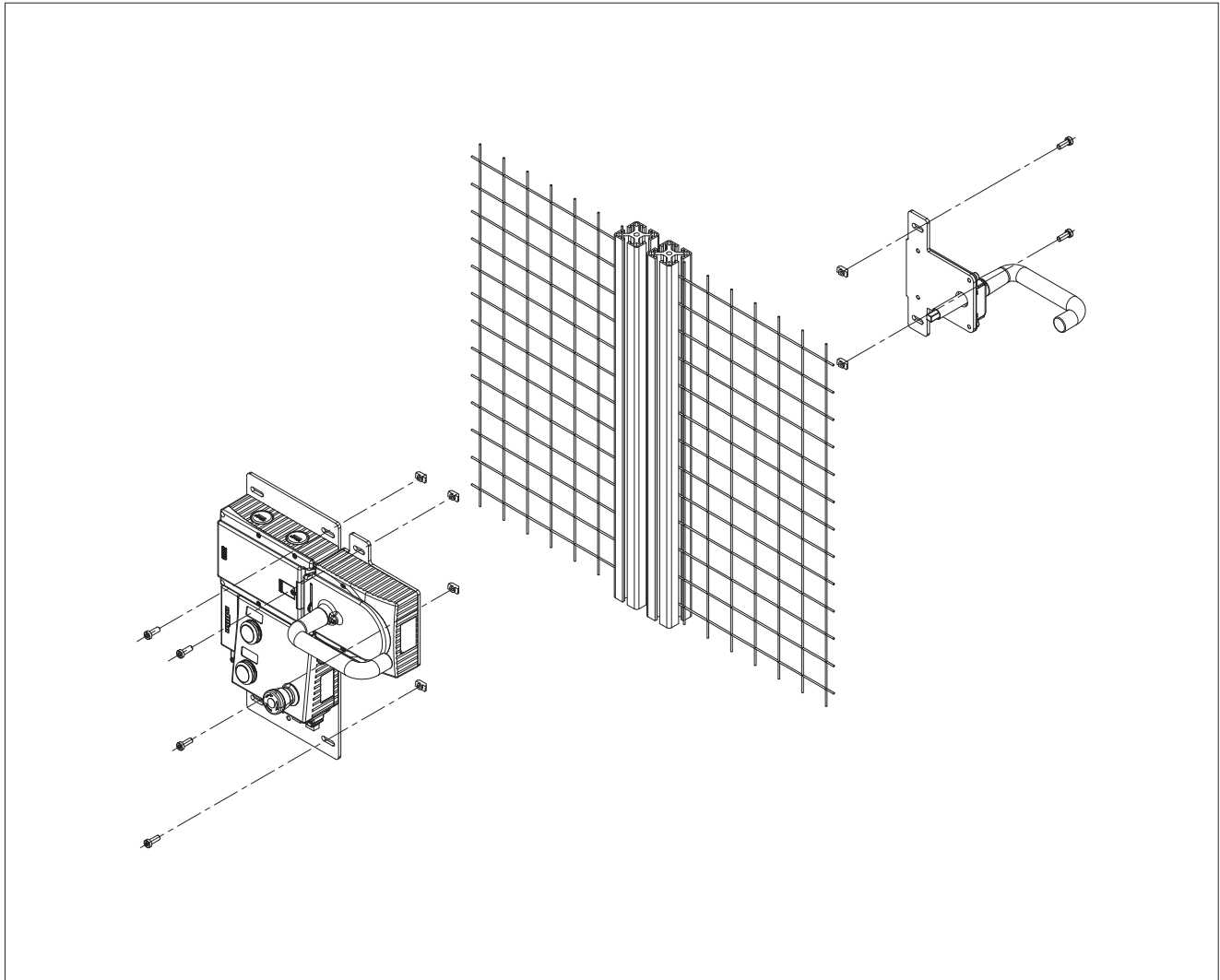


Figure 9: Installation example for door hinged on the right (general view)

Changing the actuating direction (here: from right to left)

Important!

It is only possible to make this change when the bolt tongue is not extended and an escape release is not yet mounted.

As supplied, the handle module is set either for doors hinged on the right or for doors hinged on the left.

Based on the example of a handle module for doors hinged on the right this means:

- The safety guard opens by pressing down the door handle.
- The system is mounted the other way up for doors hinged on the left. In other words, the safety guard opens by pressing up the door handle (see Figure 10). For this reason the actuating direction of the door handle must be changed (see Figures 10 - 15).

(This is similar for handle modules for doors hinged on the left.)

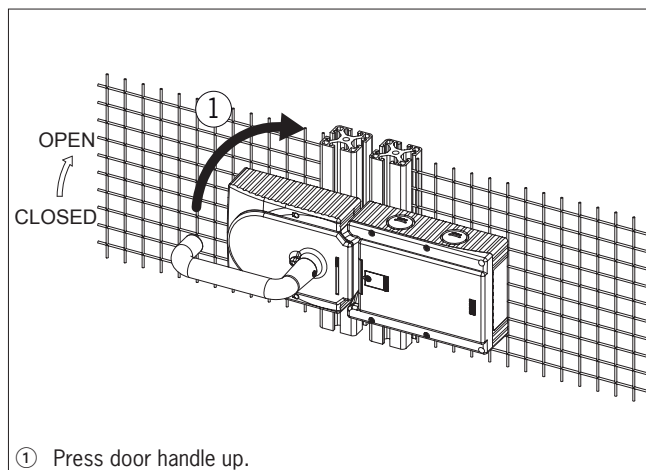


Figure 10: Changing actuating direction, step ①

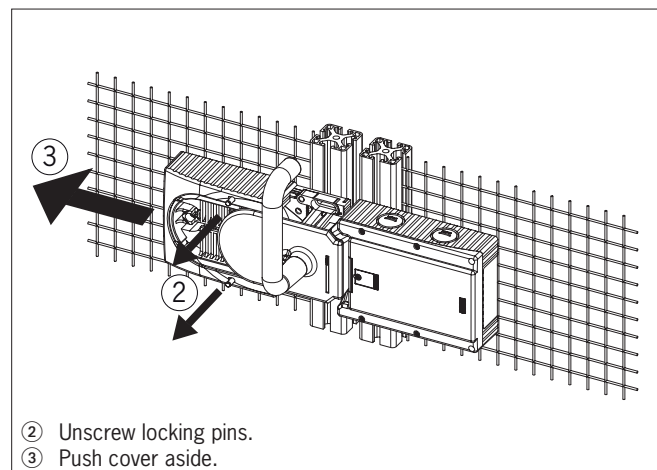


Figure 11: Changing actuating direction, steps ② and ③

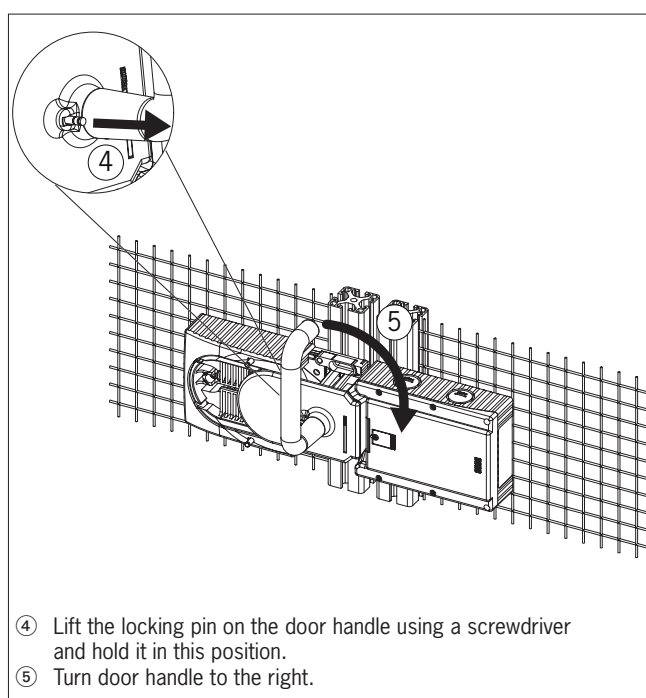


Figure 12: Changing actuating direction, steps ④ and ⑤

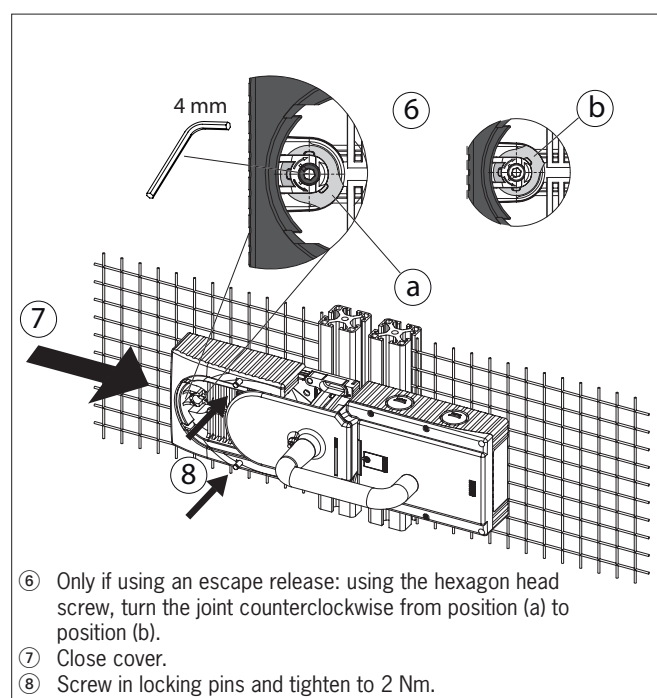


Figure 13: Changing actuating direction, steps ⑥ to ⑧

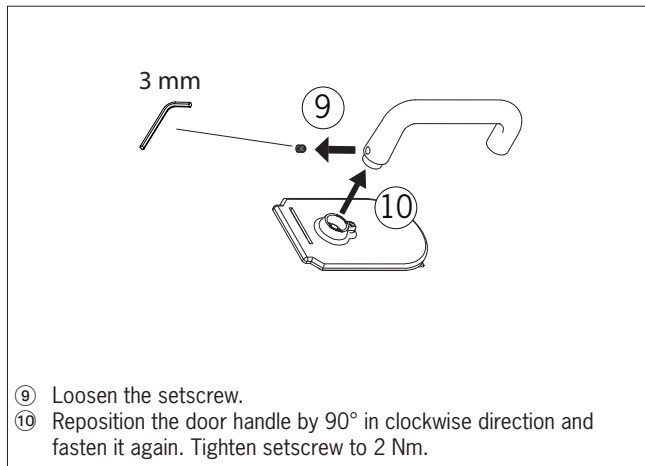


Figure 14: Changing actuating direction, steps ⑨ and ⑩

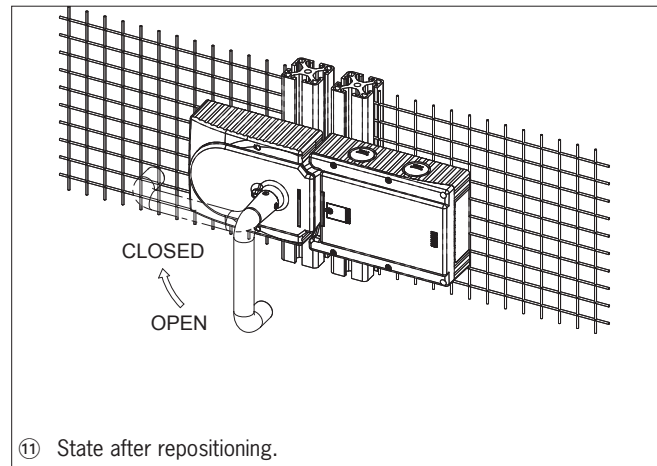


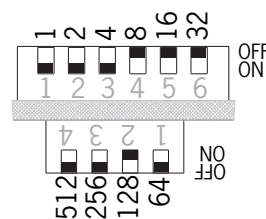
Figure 15: Changing actuating direction, final state

Controls and indicators

LEDs on the bus module

LED	Color	Description
Link 1 and Link 2	green	Bus plug inserted: statically on
Data 1 and Data 2	yellow	Data transfer: flashing
SF	red	System error: statically on (see section on diagnostic messages of the MGB system)
BF	red	Bus error: statically on (see section on diagnostic messages of the MGB system)
ON	green	Self test OK: statically on Subscriber passivated: flashing
UB	green	Power supply OK: statically on

Binary coding of the DIPswitches for PRO-Flsafe address (factory setting: 135)



default address:
 $128 + 4 + 2 + 1 = 135$

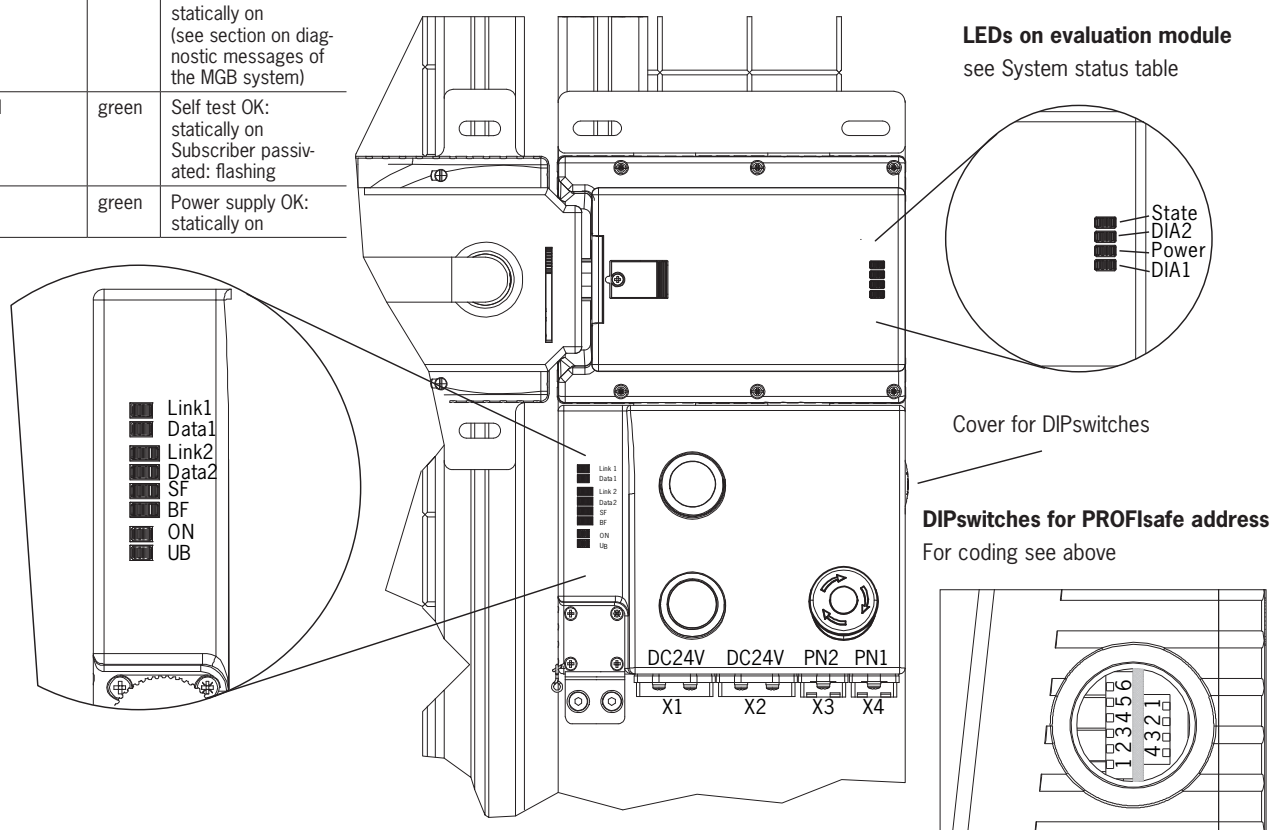


Figure 16: Displays and controls/binary coding of the DIPswitches for PRO-Flsafe address (factory setting: 135)

Protection against environmental effects

Lasting and correct safety function requires that the system must be protected against foreign bodies such as swarf, sand, blasting shot, etc., which can become lodged in the locking and handle modules. For this purpose a suitable installation position should be selected.

Cover device during painting work!


Electrical connection

Warning!

Mounting must be performed only by authorized personnel.

Caution!


Risk of damage to equipment or malfunctions as a result of incorrect connection.

- All the electrical connections must either be isolated from the mains supply by a safety transformer according EN IEC 61558-2-6 with limited output voltage in the event of a fault, or by other equivalent isolation measures.
- For use and operation as per the  requirements, a power supply with the feature "for use in class 2 circuits" must be used. The same requirement applies to the safety outputs.

Alternative solutions must comply with the following requirements:

- a) Electrically isolated power supply unit with a max. open-circuit voltage of 30 V/DC and a limited current of max. 8 A.
- b) Electrically isolated power supply unit in combination with fuse as per UL248. This fuse should be designed for max. 3.3 A and should be integrated into the 30 V/DC voltage section.
- In order to avoid EMC interference, the physical environmental and operating conditions at the installation site of the device must comply with the requirements according to the standard DIN EN 60204-1:2006, section 4.4.2/ EMC).

Important!

- The supply for further subscribers on the bus may be forwarded via the Euchner MGB system. The entire supply current through the MGB must not be higher than specified in the section Technical data.
- The function earth  must be connected. An M6 threaded bore is available on the mounting plate for this purpose.
- If the device does not appear to function when operating voltage is applied (e.g. UB LED does not illuminate), the safety switch must be returned unopened to the manufacturer.
- Tighten screw for the cover for the mechanical release to 0.5 Nm.

Connections on bus module

The bus module includes the PROFINET connections (X3 and X4) and the power supply connections (X1 and X2). Depending on the version, connection is made via push-pull plugs according to IEC 61076-3-117, variant 14 or 7/8"-plugs according to ANSI/B93.55M-1981 and M12 plugs (d-coded) according to IEC 61076-2-101.

The bus module includes a PPOFINET RT switch for Ethernet connection.

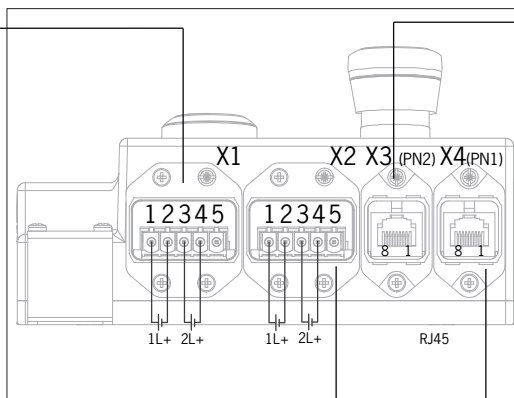
Terminal assignment for version with push-pull plugs

Pin	Description
X1.1	L1 operating voltage DC 24 V
X1.2	N1 operating voltage 0 V
X1.3	L2 auxiliary power* DC 24 V
X1.4	N2 auxiliary power* 0 V
X1.5	Function earth

* The auxiliary power is not required for the MGB system

X2: For looping through for connected devices

Pin	Description
X2.1	L1 operating voltage DC 24 V
X2.2	N1 operating voltage 0 V
X2.3	L2 auxiliary power* DC 24 V
X2.4	N2 auxiliary power* 0 V
X2.5	Function earth



Pin	Description
X3.1	Receive Data +RD
X3.2	Receive Data -RD_N
X3.3	Transmit Data +TD
X3.4	Ground GND (RJ45)
X3.5	Ground GND (RJ45)
X3.6	Transmit Data -TD_N
X3.7	Ground GND (RJ45)
X3.8	Ground GND (RJ45)

Pin	Description
X4.1	Receive Data +RD
X4.2	Receive Data -RD_N
X4.3	Transmit Data +TD
X4.4	Ground GND (RJ45)
X4.5	Ground GND (RJ45)
X4.6	Transmit Data -TD_N
X4.7	Ground GND (RJ45)
X4.8	Ground GND (RJ45)

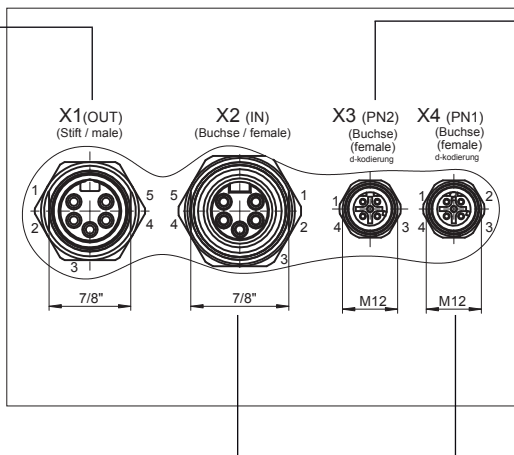
Terminal assignment for version with 7/8" and M12 plugs

Pin	Description
X1.1	N2 auxiliary power *0 V
X1.2	N1 operating voltage 0 V
X1.3	Function earth
X1.4	L1 operating voltage DC 24 V
X1.5	L2 auxiliary power* DC 24 V

* The auxiliary power is not required for the MGB system

X2: For looping through for connected devices

Pin	Description
X2.1	N2 auxiliary power *0 V
X2.2	N1 operating voltage 0 V
X2.3	Function earth
X2.4	L1 operating voltage DC 24 V
X2.5	L2 auxiliary power* DC 24 V



Pin	Description
X3.1	Transmit Data +TD
X3.2	Receive Data +RD
X3.3	Transmit Data -TD_N
X3.4	Receive Data -RD_N
Function earth on plug housing	

Pin	Description
X4.1	Transmit Data +TD
X4.2	Receive Data +RD
X4.3	Transmit Data -TD_N
X4.4	Receive Data -RD_N
Function earth on plug housing	

Setup

Integrating into PROFINET and PROFIsafe

Attention:

The parameters "Update time" and "F-WD-Time" have a decisive effect on the reaction time of the safety function. The safety function could be lost if the reaction times are too long.

Important!

You will require the corresponding GSD file in GSDML format in order to integrate the MGB system:

▸ GSDML-Vx.x-EUCHNER-MGB_110026-YYYYMMDD.xml

You can find the GSD file in the download area at www.EUCHNER.de.

Prior to commissioning, the GSD file must be imported into the configuration software for the control system (see control system manual).

You must perform the following steps to integrate the MGB system into PROFINET:

1. Configure the MGB system with the configuration software of the control system and assign parameters.

The following PROFINET parameters must be set:

- Device name (factory setting from GSD file): [euchnermgb].
- IPaddress: optionally fixed or dynamic
- Update time
Recommendation [32 ms]
Maximum value [128 ms]
(with number of repeat cycles = 3)

The following PROFIsafe parameters must be set:

- F_dest_adr (PROFIsafe address): this is generally assigned automatically by the control system.
- F_WD_Time (time during which the control system expects a response by the PROFIsafe device): [xxx ms]. Factory setting from GSD file: (600 ms)

2. Set the PROFIsafe address (F_dest_adr) on the MGB system using the DIP-switches (see Figure 16). Important: Identical addresses must be set in the control system and on the device.
3. Save the configuration and transfer it to the MGB system.

Replacement of an MGB system without programming device

If servicing is required, the MGB system is easy to replace with a new one. For this purpose, the following prerequisites must be met:

- The DIPswitch settings (PROFIsafe address) of the new device must match those of the old device.
- Your Profinet master must support the automatic replacement of Profinet subscribers.
- Your Profinet topology must be correctly configured.
- The replacement device must be connected to the same port as its predecessor.
- There must be no device name in the MGB system.
This field is empty in the as-delivered state. Systems that already contain a name must first be reset to the factory settings.

Once these conditions are met, simply replace the old system with the new system. The Profinet bus does not need to be switched off for this purpose.

System reset to factory settings

You will find detailed instructions in the manual for the configuration software for your control system.

Teach-in operation (only MGB unicode)

The handle module must be assigned to the locking module using a teach-in function before the system forms a functional unit.

During a teach-in operation the system is in the safe state (bit `SI1.0` / `SI1.1` is not set).

Important!

- The locking module disables the code for the previous handle module if teach-in is carried out for a new handle module. Teach-in is not possible again immediately for this device if a new teach-in operation is carried out. The disabled code is deleted in the locking module only after a third code has been taught.
- The locking module can only be operated with the last handle module taught.
- If, in the teach-in standby state, the locking module detects the handle module taught-in or a disabled handle module, the teach-in standby state is ended immediately and the locking module changes to the normal state.
- If the bolt tongue is in the operating distance for less than 60 s, the handle module is not taught.

Teaching in handle module

1. Fit handle module.
2. Close the safety guard. Check for correct alignment and distance using the marking on the locking module and re-adjust if necessary.
3. Insert bolt tongue in the locking module.
4. Apply operating voltage to the locking module.
- Teach-in process starts, green LED (DIA1) flashes slowly (approx. 2 Hz). The teach-in standby state is active for 3 minutes after switch on. During teach-in, the locking module checks whether the handle module is a disabled handle module. Provided this is not the case, the teach-in operation is completed after approx. 60 seconds, and the green LED (DIA1) goes out. The new code has now been stored, and the old code is disabled.
5. Reset via bit `OO.1` in the data block of the diagnostic function to activate the taught-in code of the handle module in the locking module.

Mechanical function test

It must be possible to easily insert the bolt tongue in the locking module. To check, close safety guard several times and actuate door handle.

If available, check function of the escape release. It must be possible to operate the escape release from the inside without excessive effort.

Electrical function test

1. Switch the operating voltage on or perform a reset via output bit 00.1 in the data block of the diagnostic function.
 2. Close all safety guards and insert the bolt tongue into the locking module.
In the case of guard locking by solenoid force, ➡ activate guard locking.
 - The machine must not start automatically.
 - It must not be possible to open the safety guard.
 - The yellow STATE LED illuminates continuously.
 3. Enable operation in the control system.
 - It must not be possible to deactivate guard locking as long as operation is enabled.
 4. Disable operation in the control system and deactivate guard locking.
 - The safety guard must remain locked until there is no longer any risk of injury.
 - It must not be possible to start the machine as long as the guard locking is deactivated.
 - It must be possible to open the safety guard.
- Repeat steps 2-4 for each safety guard.

PROFINET data bytes (data blocks for unsafe functions)

The following modules can be present in various combinations in an MGB system:

- Bus module, MGB-B...PN (contains everything required for the PROFINET connection)
- Evaluation module, MGB-L. (forms the door locking mechanism together with the handle module)
- Control module, MGB-C. (includes various controls/indicators)

Each MGB module occupies a certain number of PROFINET data bytes in the input and output range of the control system.

The PROFINET data bytes for every MGB module or also individual functions are combined in data blocks (see tables below).

A distinction is made between the following data block types:

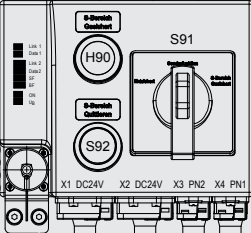
- Data blocks for MGB modules
- Data blocks for individual functions

These data blocks are automatically assigned to the designated slots in the configuration software of the control system when your MGB system is placed. This assignment changes according to MGB system. The exact assignment of the slots and the exact bit allocation for your device can be seen in the data sheet. The data sheet is included with every MGB system.

Data blocks for MGB modules

All standard functions of an MGB module are combined in these data blocks. Additional functions, e.g. an optional enabling switch or an optional stacklight, have separate data ranges (see section “Data blocks of individual functions at a glance” on page 31)

Data block for MGB bus module

MGB module	Slot	Required memory in data range of the control system (IO controller) (Refer to the data sheet of your device for the exact bit allocation)									
<div>Bus module (configuration example)</div> 	For slot assignment, see data sheet	Input range (2 bytes)	Switch	S97	S96	S95	S94	S93	S92	S91	S90
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
				I1.7	I1.6	I1.5	I1.4	I1.3	I1.2	I1.1	I1.0
		Output range (1 byte)	Display	H97	H96	H95	H94	H93	H92	H91	H90
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

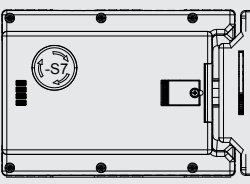
Bit allocation for 1st byte

Input range	Bit	Description	Output range	Bit	Description
	I0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)		O0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)
	I0.1			O0.1	
	I0.2			O0.2	
	I0.3			O0.3	
	I0.4			O0.4	
	I0.5			O0.5	
	I0.6			O0.6	
	I0.7			O0.7	

Bit allocation for 2nd byte

Input range	Bit	Description			
	I1.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)			
	I1.1				
	I1.2				
	I1.3				
	I1.4				
	I1.5				
	I1.6				
	I1.7				

Data block for MGB evaluation module L0, L1 or L2

MGB module	Slot	Required memory in data range of the control system (IO controller) (Refer to the data sheet of your device for the exact bit allocation)									
<div>Locking module (configuration example)</div> 	For slot assignment, see data sheet	Input range (1 byte)	Switch	ÜK	SK	-	-	-	Z	R	T
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
		Output range (1 byte)	Display	-	-	-	-	-	-	-	Guard locking solenoid
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

Bit allocation

Input range	Bit	Description	Output range	Bit	Description
	I0.0	T (door position)		O0.0	Guard locking solenoid – control voltage on (function identical to bit S00.0 => but control from PROFINET area)
	I0.1	R (bolt position)		O0.1	n.c.
	I0.2	Z (guard locking)		O0.2	n.c.
	I0.3	n.c.		O0.3	n.c.
	I0.4	n.c.		O0.4	n.c.
	I0.5	n.c.		O0.5	n.c.
	I0.6	SK (T AND R)		O0.6	n.c.
	I0.7	ÜK (T AND R AND Z)		O0.7	n.c.

Data block for MGB control module

MGB module	Slot	Required memory in data range of the control system (IO controller) (Refer to the data sheet of your device for the exact bit allocation)									
<div>Control module (configuration example)</div> <div><div><div><div>Adjustable Start</div><div>S10</div></div><div><div>Adjustable Stop</div><div>S11</div></div><div><div>Adjustable Emergency Stop</div><div>S12</div></div></div><div><div></div><div>S15</div></div><div><div></div><div>S14</div></div><div><div>Adjustable Emergency Run</div><div>S13</div></div></div>	For slot assignment, see data sheet	Input range (2 bytes)	Switch	S17	S16	S15	S14	S13	S12	S11	S10
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
				I1.7	I1.6	I1.5	I1.4	I1.3	I1.2	I1.1	I1.0
		Output range (1 byte)	Display	H17	H16	H15	H14	H13	H12	H11	H10
Bit	O0.7		O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0		

Bit allocation for 1st byte

Input range	Bit	Description	Output range	Bit	Description
	I0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)		O0.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)
	I0.1			O0.1	
	I0.2			O0.2	
	I0.3			O0.3	
	I0.4			O0.4	
	I0.5			O0.5	
	I0.6			O0.6	
	I0.7			O0.7	

Bit allocation for 2nd byte

Input range	Bit	Description
	I1.0	Depends on your configuration variant (refer to the data sheet of your device for the exact bit allocation)
	I1.1	
	I1.2	
	I1.3	
	I1.4	
	I1.5	
	I1.6	
	I1.7	

Data blocks of individual functions at a glance

Function data blocks are required for all additional functions that are not included in the data blocks for MGB modules.

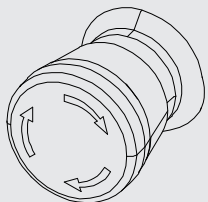
Data block for signal stack module function (optional)

If your MGB system includes this function, the interface to the signal stack module is usually plug connector X6. The following table shows which bit is assigned to which pin of X6. Please refer to the data sheet for any deviations from this.

Function	Slot	Required memory in data range of the control system (IO controller) (Refer to the data sheet of your device for the exact bit allocation)									
Signal stack module	For slot assignment, see data sheet	Output range (1 byte)	Pin	-	-	-	X6.8	X6.6	X6.5	X6.2	X6.7
			Bit	00.7	00.6	00.5	00.4	00.3	00.2	00.1	00.0

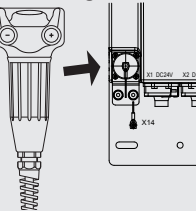
Bit allocation		
Output range	Bit	Description
	00.0	Pin 7 on plug connector X6
	00.1	Pin 2 on plug connector X6
	00.2	Pin 5 on plug connector X6
	00.3	Pin 6 on plug connector X6
	00.4	Pin 8 on plug connector X6
	00.5	n.c.
	00.6	n.c.
	00.7	n.c.

Data block for emergency stop function (optional)

Function	Slot	Required memory in data range of the control system (IO controller) (Refer to the data sheet of your device for the exact bit allocation)										
<div>Emergency stop</div> 	For slot assignment, see data sheet	Input range (1 byte)	Switching element		-	-	-	-	-	-	Signal-ing contact	
			Bit	I 0.7	I 0.6	I 0.5	I 0.4	I 0.3	I 0.2	I 0.1	I 0.0	
		Output range (1 byte)	Display		-	-	-	-	-	-	-	LED (op-tional)
			Bit	O 0.7	O 0.6	O 0.5	O 0.4	O 0.3	O 0.2	O 0.1	O 0.0	

Bit allocation		
Input range	Bit	Description
	I0.0	Emergency stop signaling contact
	I0.1	n.c.
	I0.2	n.c.
	I0.3	n.c.
	I0.4	n.c.
	I0.5	n.c.
	I0.6	n.c.
	I0.7	n.c.
Output range	Bit	Description
	00.0	Emergency stop lighting (optional)
	00.1	n.c.
	00.2	n.c.
	00.3	n.c.
	00.4	n.c.
	00.5	n.c.
	00.6	n.c.
	00.7	n.c.

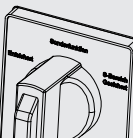
Data block for enabling switch function (optional)

Function	Slot	Required memory in data range of the control system (IO controller) (Refer to the data sheet of your device for the exact bit allocation)									
<div>Enabling switches</div> 	For slot assignment, see data sheet	Input range (1 byte)	Function	Holder	+ button	- button	-	-	-	-	Enabling
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
		Output range (1 byte)	Display	-	-	-	-	-	-	- button LED	+ button LED
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

Bit allocation

Input range	Bit	Description	Output range	Bit	Description
	I0.0	Enabling switch in "enabling" position (signaling contact)		O0.0	Enabling switch illumination for + button
	I0.1	n.c.		O0.1	Enabling switch illumination for - button
	I0.2	n.c.		O0.2	n.c.
	I0.3	n.c.		O0.3	n.c.
	I0.4	n.c.		O0.4	n.c.
	I0.5	Enabling switch + button		O0.5	n.c.
	I0.6	Enabling switch - button		O0.6	n.c.
	I0.7	Enabling switch stop detection		O0.7	n.c.

Data block for operating mode selector switch function (optional)

Function	Slot	Required memory in data range of the control system (IO controller) (Refer to the data sheet of your device for the exact bit allocation)									
<div>Operating mode selector switch</div> 	For slot assignment, see data sheet	Input range (1 byte)	Switch (coding 2 from 3)	-	-	-	-	-	S91		
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
		Output range (1 byte)	Display	-	-	-	-	-	-	-	-
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

Bit allocation

Input range	Bit	Description	Output range	Bit	Description
	I0.0	Operating mode selector switch bit 1		O0.0	n.c.
	I0.1	Operating mode selector switch bit 2		O0.1	n.c.
	I0.2	Operating mode selector switch bit 3		O0.2	n.c.
	I0.3	n.c.		O0.3	n.c.
	I0.4	n.c.		O0.4	n.c.
	I0.5	n.c.		O0.5	n.c.
	I0.6	n.c.		O0.6	n.c.
	I0.7	n.c.		O0.7	n.c.

Data block for diagnostic function

Function	Slot	Required memory in data range of the control system (IO controller) (see below for exact bit allocation)									
Diagnostics	For slot assignment, see data sheet	Input range (1 byte)	Message	Life	-	-	272(6) 273(6)	272(2) 273(2)	272(1) 273(1)	274(4)	72
			Bit	I0.7	I0.6	I0.5	I0.4	I0.3	I0.2	I0.1	I0.0
		Output range (1 byte)	Acknowledgment	-	-	-	-	-	-	Reset MGB	Acknowledgment
			Bit	O0.7	O0.6	O0.5	O0.4	O0.3	O0.2	O0.1	O0.0

Bit allocation					
Input range	Bit	Description	Output range	Bit	Description
	I0.0	Device diagnosis (PROFIsafe error 72): message present. Diagnostic code: see table of device-specific messages.		O0.0	Device diagnosis: Acknowledge message; acknowledgment of I0.2, I0.3 or I0.4. I0.0 is also acknowledged if only one message is present
	I0.1	Device diagnosis, device-specific message 274(4) "Plausibility check found an error (e.g. escape release actuated)"		O0.1	Trigger MGB locking module reset: Acknowledge message; acknowledgment of I1. I0 is also acknowledged if only one message is present.
	I0.2	Device diagnosis, device-specific message 272(1) or 273(1) "Error in emergency stop"		O0.2	n.c.
	I0.3	Device diagnosis, device-specific message 272(2) or 273(2) "Error in enabling switch"		O0.3	n.c.
	I0.4	Device diagnosis, device-specific message 272(6) or 273(6) "Error in operating mode selector switch"		O0.4	n.c.
	I0.5	n.c.		O0.5	n.c.
	I0.6	n.c.		O0.6	n.c.
	I0.7	Mechanical life > 1 million operating cycles		O0.7	n.c.

PROFIsafe data bytes (data blocks for safe functions)

Safe PROFINET data are transmitted in addition to the unsafe PROFIsafe data. They include all information on door position and guard locking, emergency stop and the enabling switch, for example.

The PROFIsafe data block includes all safe functions and is always 6 bytes in size. It is subdivided as follows:

2 input bytes of data for the functions (e.g. emergency stop switch position)

4 input bytes used within PROFIsafe

1 output byte for the functions (e.g. safe control of guard locking)

All data bits are present in parallel in the unsafe PROFINET and can be used as a signaling bit there.

IMPORTANT: Never use the signaling bits for safety functions.

Data block for PROFIsafe

Important!

- › Refer to the data sheet enclosed with your MGB system for the exact bit allocation. Use only bits that are specified according to the data sheet.

Function	Slot	Required memory in data range of the control system (IO controller) (see below for exact bit allocation)										
Diagnostics	For slot assignment, see data sheet	Input range (6 bytes)	Function		Operating mode selector switch			Guard locking (Z)	Bolt position (R)	Door position (T)	Enabling switch	Emergency stop
			1st byte	SI0.7	SI0.6	SI0.5	SI0.4	SI0.3	SI0.2	SI0.1	SI0.0	
			Function		-	-	-	-	-	-	ÜK	SK
			2nd byte	SI1.7	SI1.6	SI1.5	SI1.4	SI1.3	SI1.2	SI1.1	SI1.0	
			Function									
			3rd - 6th bytes	Used within PROFIsafe (control byte, CRC, etc.)								
		Output range (6 bytes)	Function		-	-	-	-	-	-	-	Guard locking
			1st byte	SO0.7	SO0.6	SO0.5	SO0.4	SO0.3	SO0.2	SO0.1	SO0.0	
			Function		-	-	-	-	-	-	-	-
			2nd byte	SO1.7	SO1.6	SO1.5	SO1.4	SO1.3	SO1.2	SO1.1	SO1.0	
			Function									
			3rd - 6th bytes	Used within PROFIsafe (control byte, CRC, etc.)								

Bit allocation for 1st byte						
Input range	Bit	Description	Output range	Bit	Description	
	SI0.0	Emergency stop		SO0.0	Guard locking solenoid – control voltage on (function identical to bit O0.0 in data block for MGB evaluation module L0, L1 or L2 => but with safe control of the PROFIsafe)	
	SI0.01	Enabling switch Enabling contacts closed (three-stage enabling switch in center position), no evaluation of the edges		SO0.1	n.c.	
	SI0.2	Door position (T)		SO0.2	n.c.	
	SI0.3	Bolt position (R)		SO0.3	n.c.	
	SI0.4	Guard locking (Z)		SO0.4	n.c.	
	SI0.5	Operating mode selector switch 1st bit		SO0.5	n.c.	
	SI0.6	Operating mode selector switch 2nd bit		SO0.6	n.c.	
	SI0.7	Operating mode selector switch 3rd bit		SO0.7	n.c.	
Bit allocation for 2nd byte						
Input range	Bit	Description	Output range	Bit	Description	
	SI1.0	SK (T AND R)		SO1.0	n.c.	
	SI1.1	ÜK (T AND R AND Z)		SO1.1	n.c.	
	SI1.2	n.c.		SO1.2	n.c.	
	SI1.3	n.c.		SO1.3	n.c.	
	SI1.4	n.c.		SO1.4	n.c.	
	SI1.5	n.c.		SO1.5	n.c.	
	SI1.6	n.c.		SO1.6	n.c.	
	SI1.7	Reserved for customer-specific function		SO1.7	n.c.	

Diagnostic messages of the MGB system

All diagnostic messages are listed below. The scope of possible messages may differ according to the version of the MGB system.

PROFIsafe messages

Display via LED BF (see Figure 10)

No.	Description	Measures/remedying errors
64	Error when comparing the PROFIsafe destination address (F_Dest_Add)	1. Check DIPswitch position 2. Restart system
65	Invalid PROFIsafe destination address (F_Dest_Add)	1. Check addressing 2. Restart system
66	Invalid PROFIsafe source address (F_Source_Add)	1. Check addressing 2. Restart system
67	Value for the PROFIsafe time monitoring is 0 ms (F_WD_TIME)	1. Check system times 2. Restart system
68	Parameter F_SIL exceeds SIL of the device-specific application	1. Check settings 2. Restart system
69	Parameter F_CRC_Length does not match the generated values	1. Check settings 2. Restart system
70	Version for F_Parameter not correct	1. Check configuration 2. Restart system
71	Error CRC 1- (during booting)	1. Restart system
72	Device-specific diagnostic information (see following table)	1. Identify error via input bit 10.0 2. For error remedy, see the following table with device-specific messages

Device-specific diagnostic information

Display via LED SF (see Figure 10)

Discrepancy error (two-channel monitoring detected an error)

Note:

- The discrepancy time is the maximum time during which channel 1 and channel 2 may have different signal states.
- If acknowledgment was unsuccessful, send the device to the manufacturer.

No.	Description	Measures/remedying errors
272	Discrepancy time exceeded	1. Search for cause 2. Acknowledge fault (via output bit 00.0)
272(1)	Emergency-stop discrepancy time exceeded	1. Press emergency stop 2. Acknowledge fault (via output bit 00.0)
272(3)	Door position discrepancy time exceeded	1. Open the door 2. Acknowledge fault (via output bit 00.0)
272(4)	Bolt-position discrepancy time exceeded	1. Open the door 2. Acknowledge fault (via output bit 00.0)
272(5)	Guard-locking discrepancy time exceeded	1. Open the door 2. Acknowledge fault (via output bit 00.0)

Test-pulse error (short-circuit monitoring detected an error)

Note:

- Emergency Stop must **not** be pressed during acknowledgment.
- If acknowledgment was unsuccessful, send the device to the manufacturer.

No.	Description	Measures/remedying errors
273	Test pulse erroneous	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit 00.0 necessary.
273(1)	Emergency-stop test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Check system 2. Acknowledgment via output bit 00.0 necessary.
273(3)	Door-position test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close door 2. Acknowledgment via output bit 00.0 necessary.
273(4)	Bolt-position test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close door 2. Acknowledgment via output bit 00.0 necessary.
273(5)	Guard-locking test pulses erroneous	Safety function is switched off while no test pulses are being detected. 1. Close and lock door. 2. Acknowledgment via output bit 00.0 necessary.

General messages of the overall system

No.	Description	Measures/remedying errors
274(1)	Max. (mech.) mechanical life exceeded	Message via input bit 10.7 Message cannot be reset
274(2)	Internal device error	Please contact our support organization!
274(3)	Signal sequence erroneous (e.g. broken bolt tongue recognized)	1. Check mech. functions 2. Acknowledge fault (via output bit 00.1). The safety door must be open.
274(4)	Plausibility test detected an error (e.g. escape release actuated)	Important: The resetting procedure is contained in the section "Latching fault when actuating the escape release" • Acknowledge fault (via output bit 00.1)
274(5)	Locking module in error	Please contact our support organization!

PROFIsafe errors

No.	Description	Measures/remedying errors
276(1)	Starting error PROFIsafe	Please contact our support organization!
276(2)	Memory error RAM	
276(3)	Memory error FLASH	
276(4)	Communication error	
276(5)	Synchronization error	
276(6)	Voltage monitoring	

General messages of the overall system

No.	Description	Measures/remedying errors
277(1)	Starting error MGB	Please contact our support organization!
277(2)	Communication error	
278	Internal device error	

Cyclical Profisafe status message

Bit	Description	Measures/remedying errors
0	reserved	-
1	Error in F-Device or F-Module	Subscriber is passivated (on LED flashes). You will find information on depassivating in the manual for your control system.
2	Communication error, CRC error	
3	Communication error, watchdog timeout	
4	Fail-safe values activated	-
5	Toggle bit	-
6	Consecutive number was reset	-
7	reserved	-

PROFINET alarms**Fault in stacklight module**

Short circuits on the stacklight module are output as a PROFINET diagnostic alarm (alarm number 1: short circuit).

System status table LEDs on interlocking/locking module

Operating mode	Guard position	Position of the bolt tongue	Guard locking	Guard position SIO.2	Bolt position SIO.3	Guard locking SIO.4	UK Input bit SIO.1	Input bit IO.0	Input bit IO.1	Input bit IO.7	LED indicator				State	
											DIA 1 (green)		POWER	DIA 2 (red)		STATE (yellow)
Normal operation	open	not inserted	off	off	off	off	off	off	off	X	○	☀	○	○	Normal operation, door open	
	closed	not inserted	off	on	off	off	off	off	off	X	○	☀	○	0.5 Hz	Normal operation, door closed	
	closed	inserted	off	on	on	off	off	off	off	X	○	☀	○	2 Hz	Normal operation, door closed, bolt tongue inserted	
	closed	inserted	on	on	on	on	off	off	off	X	○	☀	○	☀	Normal operation, door closed and locked	
	X	X	X	X	X	X	X	X	off	on	on	X	☀	1 Hz	X	Max mech. life exceeded*****
Teach-in standby (only for MGB uni-code)	open	not inserted	off	off	off	off	off	off	off	X	☀	☀	○	○	Door open; unit is ready for teach-in for another handle module (only short time after power-up)	
Setup (only for MGB uni-code)	closed	inserted	on	off	on	on	off	off	off	X	☀	☀	○	○	Teach-in operation	
	X	X	X	off	off	off	off	off	off	X	○	☀	1 Hz	○	Positive acknowledgment after completion of teach-in operation	
Fault display	X	X	X	off	off	off	off	on	off	X	☀	☀	☀	○	Handle module read error (e.g. error in code or code cannot be read)**	
	X	X	X	off	off	off	off	on	off	X	☀	☀	☀	○	Internal fault (e.g. component faulty, data fault)*	
	X	X	X	off	off	off	off	on	off	X	☀	☀	☀	○	Signal sequence erroneous (e.g. broken bolt tongue recognized)***	
	X	X	X	off	off	off	off	on	on	X	☀	☀	☀	○	Plausibility test erroneous (e.g. after actuation of the escape release)*	
	○											LED not illuminated				LED not illuminated
Key to symbols	☀											LED illuminated				LED illuminated
	☀ 10 Hz (8 s)											LED flashes for 8 seconds at 10 Hz				LED flashes for 8 seconds at 10 Hz
	☀ 3 x											LED flashes three times				LED flashes three times
	X											Any state				Any state

* Latching fault; use the corresponding output bit to reset (see section on diagnostic messages of the MGB system)

** Non-latching fault; open safety guard and close it again to reset

*** Latching fault; use the corresponding output bit to reset (see section on diagnostic messages of the MGB system)

**** Latching fault; reset not possible. Normal operation still possible, but the system should be replaced

Important: If you do not find the displayed device status in the System status table, this indicates an internal device fault. In this case, you should contact the manufacturer.

Technical data

Note:

If a product data sheet is included with the product, the information on the data sheet applies in case of discrepancies with the operating instructions.

Parameter	Value
s _{gr} max. door position	65 mm
Housing material	Fiber glass reinforced plastic, die-cast zinc, nickel-plated, stainless steel, powder-coated sheet steel
Dimensions	See dimension drawing
Weight of MGB-L.B (bus module, locking module and button module with mounting plate)	4.05 kg
Weight of handle module with mounting plate	1.20 kg
Weight of escape release module with mounting plate	1.15 kg
Ambient temperature	-20 ... +55 °C
Degree of protection	IP54
Safety class	III
Degree of contamination	3
Installation position	Any
Locking force F _{zh} in accordance with GSET-19	2,000 N
Connection options, power supply	2 x push-pull power ¹⁾ or 2 x plug connectors 7/8" according to ANSI/B93.55M-1981
Connection type, bus	2 x RJ 45, push-pull, according to IEC 61076-3-117 type 14, screened ¹⁾ or 2 x M12 (d-coded) according to IEC 61076-2-101
Connection cable, bus	Profinet I/O cable, at least cat. 5e
Operating voltage U _g	DC 24V +10% / -15% (PELV – see electrical connection)
Current consumption, max.	500 mA
Max. feed-in current in the connection block (push-pull plug connector)	4,000 mA
Fuse protection for power supply, external	Min. 1 A slow-blow
Safety outputs	Profisafe according to IEC 61784-3-3
Rated insulation voltage U _i	75 V
Rated impulse withstand voltage U _{imp}	0.5 kV
Resilience to vibration and shock	In accordance with EN 60947-5-3
EMC protection requirements	In accordance with EN 61000-4 and DIN EN 61326-3-1
Switching frequency max.	1 Hz
Risk times max. (switch-off times) ²⁾	
- Emergency stop	220 ms
- Enabling switch	220 ms
- Operating mode selector switch	220 ms
- Guard position	550 ms
- Bolt position	550 ms
- Guard locking	550 ms
Reliability values according to EN ISO 13849-1	
Category	4 (EN 13849-1:2008-12)
Performance Level	PL e (EN 13849-1:2008-12)
MTTF _d ³⁾	91 years
DC	99%
Mission time	20 years
PFH _d ³⁾	2.54 x 10 ⁻⁸ / h
B _{10d} ⁴⁾	
- Emergency stop	1 x 10 ⁵
- Enabling switch	According to switch information from manufacturer

1) The document *PROFINET Cabling and Interconnection Technology* from the PNO aids in the correct selection of wiring.

2) The risk time is the max. time between the change in the input status and the deletion of the corresponding bit in the bus protocol.

3) Fixed failure rate without consideration of faults in wearing parts.







4) Information regarding wearing parts without consideration of fixed failure rates in electronic components.

Troubleshooting

Latching fault when actuating the escape release

In order to achieve monitoring of the locking device in category 4, PL e according to EN ISO 13849-1, an internal monitoring logic system is integrated into every locking module.

Result: The MGB system enters into a latching fault when the escape release is actuated (refer to the “System status table LEDs on interlocking/locking module” on page 38).

Guard position	Position of the bolt tongue	Guard locking	Input bit SI3	Input bit SI4	Input bit SI5	Input bit I10	Input bit I17	Input bit I18	Input bit I24	LED indicator				State
										DIA 1 (green)	POWER	DIA 2 (red)	STATE (yel-low)	
X	X	X	off	off	off	off	on	on	X		7 x			Plausibility test erroneous (e.g. after actuation of the escape release)*
○														LED not illuminated
														LED illuminated
 10 Hz (8 s)														LED flashes for 8 seconds at 10 Hz
 3 x														LED flashes three times
X														Any state

Note:

The system might not enter into a latching fault if the escape release is actuated very slowly.

Fault reset

Proceed as follows:

1. Acknowledge via output bit $o0.1$ (in the data block for the diagnostic function).
 2. Close safety guard if necessary and switch guard locking on.
- ➔ The system is in normal mode again.

Service

If service support is required, please contact:

EUCHNER GmbH + Co. KG
Kohlhammerstraße 16
D-70771 Leinfelden-Echterdingen

Service telephone:

+49 711 7597-500

E-mail:

info@euchner.de

Internet:

www.euchner.de

Inspection and service

Warning!

Loss of the safety function because of damage to the system.
In case of damage, the affected module must be replaced completely. Only accessories or spare parts that can be ordered from EUCHNER may be replaced.

Regular inspection of the following is necessary to ensure trouble-free long-term operation:

- Check the switching function
- Check the secure fastening of the devices and the connections
- Check for deposits and wear
- Check for loose cable connections or plug connectors.

Check the safe function of the safety guard particularly

- after any setup work
- each time after the replacement of an MGB module
- after an extended period without use

No servicing is required; repairs to the device are only allowed to be made by the manufacturer.

Note:

The year of manufacture can be seen in the lower right corner of the rating plate.

Declaration of conformity

More than safety.



EUCHNER

EUCHNER GmbH + Co. KG
Kohlhammerstraße 16
70771 Leinfelden-Echterdingen
Germany

EG-Konformitätserklärung
EC-Declaration of Conformity
CE-Déclaration de Conformité
CE-Dichiarazione di conformità
CE-Declaración de conformidad

Original DE
Translation EN
Traduction FR
Traduzione IT
Traducción ES

Die nachfolgend aufgeführten Produkte sind konform mit den Anforderungen der folgenden Richtlinien (falls zutreffend):
The beneath listed products are in conformity with the requirements of the following directives (if applicable):
Les produits mentionnés ci-dessous sont conformes aux exigences imposées par les directives suivantes (si valable)
I prodotti sotto elencati sono conformi alle direttive sotto riportate (dove applicabili):
Los productos listados a continuación son conforme a los requisitos de las siguientes directivas (si fueran aplicables):

I:	2006/42/EG	Maschinenrichtlinie
	2006/42/EC	Machinery directive
	2006/42/CE	Directive Machines
	2006/42/CE	Direttiva Macchine
	2006/42/CE	Directiva de máquinas

Die Schutzziele der Niederspannungsrichtlinie wurden gemäß Anhang I, Nr. 1.5.1 der Maschinenrichtlinie eingehalten.
The safety objectives of the Low-Voltage Directive comply with Annex I, No. 1.5.1 of the Machinery Directive.
Les objectifs de sécurité de la Directive Basse Tension sont conformes à l'annexe I, No. 1.5.1 de la Directive Machines
Gli obiettivi di sicurezza della Direttiva Basse Tensione sono conformi a quanto riportato all'allegato I, No. 1.5.1 della Direttiva Macchine.
Los objetivos de seguridad de la Directiva de Bajo Voltaje cumplen con el Anexo I, No. 1.5.1 de la Directiva de Máquinas

Folgende Normen sind angewandt:
Following standards are used:
Les normes suivantes sont appliquées:
Vengono applicate le seguenti norme:
Se utilizan los siguientes estándares:

a:	EN 60947-5-3:1999 + A1:2005
b:	EN 1088: 1995+A2:2008
c:	EN ISO 13849-1:2008
d:	EN 61784-3-3:2008 (Profisafe)

Bezeichnung der Bauteile Description of components Description des composants Descrizione dei componenti Descripción de componentes	Type Type Type Tipo Tipo	Richtlinie Directives Directive Direttiva Directivas	Normen Standards Normes Norme Estándares	Zertifikats-Nr. No. of certificate Numéro du certificat Numero del certificato Número del certificado
Multifunctional Gate Box (Profinet) Multifunctional Gate Box Interrupteurs de sécurité sans contact Finecorsa di sicurezza senza contatto Interruptores de seguridad sin contacto	MGB...PN ...	I	a, b, c, d a, b, c, d a, b, c, d a, b, c, d a, b, c, d bis Version 3.23.2 up to Version 3.23.2 jusqu'à la version 3.23.2 fino alla versione 3.23.2 hasta versión 3.23.2	Z10 10 04 40393 008
	MGB-B...PN...	I	d	Z10 10 04 40393 008
	MGB-CB...PN...	I	a, b, c, d	Version 3.23.2 Z10 10 04 40393 008

Benannte Stelle
Notified Body
Organisme notifié
Sede indicata
Entidad citada

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